SECTION 05210
STEEL JOIST GIRDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Joist girders – Special

B. Related Sections include the following:
   1. Division 5 Section 05120: Structural Steel.
   2. Division 7 Section 07812: Intumescent Thin Film Fire Proofing.

1.3 DEFINITIONS

A. Special Joists: Joists requiring modification by the manufacturer to support nonuniform, unequal, or special loading conditions that invalidate SJI's "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders."

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads within limits and under conditions indicated. Provide type G series joist girder with vertical web members at all panel points.

B. Design joists to withstand design loads with total load deflections no greater than l/360 of span. Design dead load is 70 psf and design live load is 150 psf. Camber joists for a load of 100 psf. Check design of bottom chord for concentrated load of 5 kips between panel points.

1.5 SUBMITTALS

A. Product Data: For special joist girder.

B. Shop Drawings: Show layout, mark, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, accessories; splice and connection locations and details; and attachments to other construction.
   1. Indicate joist girder bearing details for attachment to beams and columns.
   2. Comprehensive engineering analysis by a qualified Professional Engineer responsible for its preparation. Calculations are to be signed and sealed by a Professional Engineer licensed in the State of Tennessee.

C. Welding Certificates: Copies of certificates for welding procedures and personnel.

D. Mill certificates signed by manufacturers of bolts certifying that their products comply with specified requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing joists similar to those indicated for this Project and with a record of successful in-service performance.
   1. Manufacturer must be certified by SJI to manufacture joists complying with SJI standard specifications and load tables.
   2. Assumes responsibility for engineering special joist girders to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified Professional Engineer.
   3. Professional Engineer Qualifications: A Professional Engineer who is legally authorized to practice in the State of Tennessee and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of joists that are similar to those indicated for this Project in material, design, and extent.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel"; and AWS D1.3 "Structural Welding Code--Sheet Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI's "Specifications" for chord and web members. Use double angles for all members.

B. High-Strength Bolts and Nuts: ASTM A 325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.
   1. Finish**:** Plain, uncoated, ASTM A 153/A 153M, Class C.

C. Welding Electrodes: Comply with AWS standards.

2.2 INTUMESCENT THIN FILM FIRE PROOFING

A. Fire Proofing: Shop apply intumescent thin film fire proofing in accordance with manufacture’s recommendations. Do not apply fireproofing to top surface of the top chord member.

2.3 SPECIAL JOIST GIRDERS

A. Manufacture joist girders according to "Standard Specifications for Joist Girders," in SJI's "Specifications," with double steel-angle for top- and bottom-chord members and web members; with end and top-chord arrangements as follows:
   1. End Arrangement: Underslung with bottom-chord extensions.

B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

C. Provide shear plates at top chord panel points for connecting steel wide flange roof beams. Provide stabilizer plates at the columns for joist girder bottom chord.

D. Camber joist girders as indicated in paragraph 1.4.B.

E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.4 JOIST ACCESSORIES

A. Supply ceiling extensions using extended bottom-chord elements.

B. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 CLEANING AND SHOP PAINTING

A. Clean joist in accordance with manufacturer’s recommendation for shop application of intumescent thin film fire proofing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
   1. Before installation, splice joists delivered to Project site in more than one piece.
   2. Space, adjust, and align joists accurately in location before permanently fastening.
   3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.

C. Bolt joists to supporting steel framework using high-strength structural bolts.

3.3 FIELD QUALITY CONTROL

A. Testing Agency:

B. Contractor shall engage a qualified independent testing and inspecting agency to inspect field welds and bolts.

C. Field welds will be visually inspected according to AWS D1.1.

D. Bolted connections will be visually inspected.

E. Correct deficiencies in Work that inspections and test reports have indicated are not in compliance with specified requirements.

F. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.4 REPAIRS AND PROTECTION

A. Touchup Fire Proofing: After installation, promptly clean, prepare, and repair fire proofing in accordance with manufacturer's recommendations.

END OF SECTION 05210